REMARKS

I. Introduction

Claims 1 to 12 are pending in the present application. Claims 5 and 6 have been amended. In view of the preceding amendments and following remarks, it is respectfully submitted that claims 1 to 12 are allowable and reconsideration is respectfully requested.

II. Rejection of Claims 3 to 6 Under 35 U.S.C.112, Second Paragraph

Claims 3 to 6 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Regarding claims 3 and 4, the Examiner questions the limitation "second pump electrode." The Office Action alleges that in claim 1, line 5, the "second pump electrode" faces the sample gas mixture, and is therefore equated with electrode 23. The Office Action further alleges that the barrier layer appears to prevent ionic conduction between the reference electrode 22a and the first pump electrode 20, and not the second pump electrode.

Applicants respectfully submit that claims 3 and 4 are fully consistent with 35 U.S.C. 112, second paragraph, and therefore the rejection should be withdrawn. Element 24, the barrier layer, as illustrated in Figure 1, is positioned on the lower section of the first solid electrolyte layer 51. The reference electrode is presented as element 22. Furthermore, the second pump electrode is indicated by reference numeral 23. As a result of the positioning of the components, the barrier layer 24 is positioned between the second pump electrode 23 and the reference electrode 22. Applicants respectfully submit that the composition of the barrier layer 24 prevents ionic conduction, as clearly indicated on page 4, lines 3 to 4. Claims 3 and 4, therefore, have proper support in the specification and the drawings. Applicants respectfully request withdrawal of the indefiniteness rejection to claims 3 and 4.

Regarding claim 5, the Office Action alleges that it is unclear what "cutout in the barrier layer" is being referred to. The Office Action further alleges that claim 6 is similarly unclear. The Office Action notes that the barrier layer 24 is level with the first pump electrode 20.

Applicants respectfully submit that, as presented on page 4, lines 6 to 11 of the specification, the barrier layer 24 may cover the entire large area of sensor element 10 between the first and second solid electrolyte layers 51,52, with a cutout being provided in the region of the first pump electrode. Page 4, lines 14 to 16 of the specification provide that the barrier layer 24 can also be located in the layer level between the second and third electrolyte layers 52,53, e.g., between the partition wall 12 and the third solid electrolyte layer 53. Applicants have amended claim 5 such that the barrier layer has a cutout around the first pump electrode. (See also Fig. 2). Claim 6 has been amended such that the barrier layer has a cutout around the measuring electrode. (See Fig. 2; p. 3, lines 22-23, referring to "ring-shaped" measuring electrode 21). Accordingly, Applicants respectfully request withdrawal of the rejection to claims 5 and 6.

III. Rejection of Claims 1 to 12 Under 35 U.S.C. 103(a)

Claims 1 to 12 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,939,615 ("Kato et al.") or U.S. Patent 5,314,604 ("Friese et al.") in view of U.S. Patent 4,559,126 ("Mase et al.") or U.S. Patent 4,505,807 ("Yamada"). Applicants respectfully submit that claims 1 to 12 are patentable for the following reasons.

Claim 1 relates to a sensor element for determining a concentration of a gas component in a gas mixture. Claim 1 recites a measuring gas chamber and at least one pump cell including at least one first pump electrode situated in the measuring gas chamber, and at least one second pump electrode situated on a surface of the sensor element facing the gas mixture. Claim 1 further provides a first solid electrolyte layer situated between the first and second pump electrodes and a reference gas chamber. Claim 1 further provides at least one concentration cell including at least one reference electrode situated in the reference gas chamber, and at least one measuring electrode cooperating with the reference electrode and being situated in the measuring gas chamber. Claim 1 still further provides a second solid electrolyte layer adjacent to the first solid electrolyte layer, in which the reference gas chamber and the measuring gas chamber are situated, and at least one barrier layer substantially preventing ionic conduction between at

least one of the electrodes of the pump cell and at least one of the electrodes of the concentration cell.

Applicants respectfully submit that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Furthermore, the resultant combination must teach or suggest every claim limitation. M.P.E.P. § 2143. Both Kato et al. and Friese et al. are silent with regards to providing any barrier layer as required in claim 1. The Office Action admits this lack of teaching. Page 4. The Office Action uses the secondary references of Mase et al. and Yamada as teaching the feature of a barrier layer. However, Applicants respectfully submit that Mase et al. and Yamada simply do not provide any disclosure or suggestion of providing "at least one barrier layer substantially preventing ionic conduction between at least one of the electrodes of a pump cell and at least one of the electrodes of the concentration cell." In Mase et al., the ceramic layer 12 is placed directly on a heater to prevent conduction of electricity from the heater 10. Mase et al., therefore, use this ceramic layer 12 in a completely different manner than "the at least one barrier layer" provided in claim 1. Mase et al. do not suggest that the ceramic layer prevents **ionic conduction**. In Fig. 7 of Yamada, the electric insulation layer 46 is placed over a heating element 43, similar to Mase et al. Again, there is no disclosure or suggestion in Yamada of the desirability of providing "at least one barrier layer substantially preventing ionic conduction between at least one of the electrodes of a pump cell and at least one of the electrodes of the concentration cell." For these reasons, the asserted combination of applied references fails to teach every limitation of claim 1. Applicants therefore respectfully request withdrawal of the rejection of claim 1 and dependent claims 2-12.

The Office Action further alleges that it would have been obvious for Kato et al. or Friese et al. to adopt a high resistance barrier layer for isolating sensor components from each other in view of Mase et al. or Yamada, and that one of ordinary skill in the art would readily recognize the possibility of electrical interference among the sensor components without such a barrier layer. Applicants respectfully traverse this conclusion. Kato et al. and Friese et al. simply do not mention anything relating to prevention of ionic conduction between "at least one of

the electrodes of a pump cell and at least one of the electrodes of the concentration cell." Kato et al. and Friese et al. do not even acknowledge this potential problem or any solutions for remedying the problem. Mase et al. and Yamada are also similarly deficient in addressing these problems. The Examiner's allegation that there may be a "possibility" of "electrical interference" is not found in any of the applied references, and the mere assertion of this "possibility" in the Office Action does not, in fact, satisfy the required limitation of preventing ionic conduction. To the extent the Examiner is making an assertion based on personal knowledge, the Examiner is requested to provide a documentary evidence to support the assertion. MPEP 2144.03.

The Office Action alleges that the reason for combination of the references would have been that one of ordinary skill in the art would readily recognize the possibility of electrical interference. This allegation indicates that the references themselves do not provide a rationale for combination. The combination of references, rather, would be performed because a person of ordinary skill in the art would recognize a possibility of interference. MPEP 2143.01 specifically provides, however, that the level of skill in the art cannot be relied upon to provide the suggestion to combine references. The suggestion for combination must come from the references themselves. The Office Action does not allege that the references themselves make this suggestion, and indeed, the references do not provide such a motivation. For this additional reason, the combination of applied references is insufficient to support a prima facie case of obviousness, and the rejection of claims 1 to 12 should be withdrawn.

Even if the secondary references could be combined with the Friese et al. or Kato et al. primary references, (and Applicants do not concede that the references can be combined), a person of ordinary skill in the art would install an insulation layer over a heater, which would not result in the limitation of "at least one barrier layer substantially preventing ionic conduction between at least one of the electrodes of the pump cell and at least one of the electrodes of the concentration cell."

Applicants also note that if the proposed modification renders the prior art invention being modified unsatisfactory for it intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d

900, 221 USPQ 1125 (Fed. Cir. 1984). Friese et al. require the exact combination of four laminated solid electrolyte sheets, 1, 2, 3, and 4; a punched-out central measuring gas supply opening 5; an annular exterior pump electrode 6, which is arranged around the measuring gas supply opening 5; interior pump electrodes 8, 8'; a diffusion channel 7; an exhaust gas electrode 9; and an air reference electrode 11 arranged in air channel 10 to form a Nernst cell. Applicants respectfully submit that addition of an insulation layer to the Friese et al. arrangement described above would disrupt the Nernst cell operation formed by the exhaust gas electrode 9 and air reference electrode 11 arranged in air reference channel 10.

Kato et al., contrary to the current invention, requires gas-tight oxygen-ion conductive solid electrolyte layers 4a, 4b, 4c, 4d and 4e to be superposed on one another so that conduction may take place. Col 11, lines 16 to 26. Placement of a barrier layer substantially preventing this configuration would not be attempted by a person skilled in the art, as the proposed modification would render Kato et al. unsatisfactory for its intended purpose, namely a configuration of ion conductive layers stacked on one another. For this additional reason, Applicants respectfully request withdrawal of the rejection of claims 1 to 12.

IV. Objection to the Specification

The Examiner objected to page 3, last line of the specification, alleging that the item "electrode layer" should be "electrode layers." Applicants have amended the relevant portion of the specification such that the paragraph beginning on page 3, line 30 recites electrode layers 51 and 52. Applicants respectfully request withdrawal of the objection to the specification.

V. Conclusion

It is respectfully submitted that all pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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